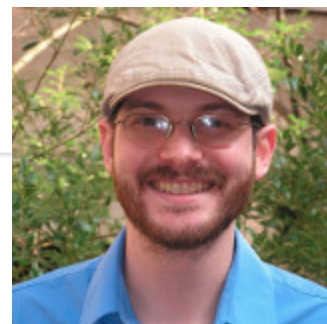# Jon Wilson, Ph.D.

Assistant Research Scientist, Texas A&M University

jsw@fnal.gov | 1-254-723-0334 | College Station, TX, USA

## SUMMARY

I am working on the discovery of dark matter using cryogenic semiconductor detectors. Currently, I am engaged in analysis of the data from the recently completed experimental run in the mine at Soudan, MN. In order to prepare for the next run, I am developing trigger and data acquisition electronics. In the future, I plan to measure the coherent scattering of neutrinos off nuclei, a process that will eventually become a dominant background in dark matter searches. In the post-discovery era, I plan to measure the properties of dark matter and to search for WIMPs that are not part of the Milky Way galaxy's thermalized dark matter halo. I hope to observe astrophysical sources of such non-thermal WIMPs, effectively creating a new field of dark matter astronomy.

In the past, I have studied the top quark and the Higgs boson using data from the Collider Detector at Fermilab. I performed the first published search for the associated production of the Higgs boson and top quarks. I also made significant advances in the study of the top-quark forward-backward asymmetry, a fascinating measurement that displayed an intriguing anomaly at the Tevatron. My work on the top quark led to my appointment as co-convener of the top and beyond the standard model physics group, an international leadership position in which I have been responsible for the scientific content of a large and active segment of the collaboration.

## EDUCATION

Aug 2007
Dec 2011

**Doctor of Philosophy** *The Ohio State University*

Physics

Advisors: Richard Hughes and Brian Winer; Thesis: *A Search for the Standard Model Higgs Boson Produced in Association with Top Quarks*

Aug 2007
Aug 2009

**Master of Science** *The Ohio State University*

Physics

Advisors: Richard Hughes and Brian Winer; Candidacy exam: *Higgs Hunting: Where and When to Find it*

| Aug 2003 | **_Bachelor of Arts_** _Baylor University_ |
| May 2007 | University Scholars |

Advisor: Jay Dittmann; Thesis: _A Measurement of the Z + b jet cross section at CDF_

## POSITIONS HELD

| Jan 2014 | **_Assistant Research Scientist_** _Texas A&M University_ |
| Present | |

| Jan 2012 | **_Postdoctoral Research Fellow_** _University of Michigan_ |
| Jan 2014 | |

| Jan 2010 | **_Graduate Research Associate_** _The Ohio State University_ |
| Dec 2011 | |

| Aug 2007 | **_Graduate Teaching Associate_** _The Ohio State University_ |
| Dec 2009 | |

## RESEARCH ACTIVITIES

| Jan 2014 | **CDMS Collaboration,** _Texas A&M University_ |
| Present | |

- Data Acquisition System (2014 - present)
  - University Research Association (URA) Visiting Scholar Award (Spring 2014)
- Trigger development (2014 - present)
- Subgroup Chair, Level 1 Trigger Algorithms (2014 - present)
- Subgroup Chair, Level 1 Trigger Implementation (2014 - present)
- Data Analysis, search for dark matter (2014 - present)

| Jun 2004 | **CDF Collaboration** _Texas A&M University, University of Michigan, The Ohio State University,_ |
| Present | _Baylor University_ |

- Co-convener of Top and Beyond the Standard Model Physics Group (Dec 2012 - present)
- Studies of top quark forward-backward asymmetry (4 publications and 6 invited presentations, Jan 2012 - present)
  - University Research Association (URA) Visiting Scholar Award (Spring 2012)
- Measurement of bottom quark forward-backward asymmetry (2013 - 2014)
- Partial wave analysis of exclusive hadron pair production (2013 - 2014)
- Editorial committee for Tevatron combined top production cross section (2012 - 2013)
- Development of CDF author list tools (2013)
- Higgs searches, including first published search for $t\bar{t}H$ (2009 - 2011)
- Data preservation (2009-2011)
- Design, construction, and maintenance of computer cluster (2009 - 2011)
- Creation of testing software for Level 1 trigger upgrade (2005 - 2007)

## RECENT PUBLICATIONS

***On the Forward-Backward Asymmetry of Leptonic Decays of Top Quarks at the Fermilab Tevatron***

Z. Hong, R. Edgar, S. Henry, D. Toback, J.S. Wilson, and D. Amidei, Phys. Rev. D 90, 014040 (2014).

***Measurement of the leptonic asymmetry in $t\bar{t}$ events produced in $p\bar{p}$ collisions at $\sqrt{s}$ = 1.96 TeV***

CDF Collaboration (T. Aaltonen *et al.*), Phys. Rev. D 88, 072003 (2013).

***Differential cross section $d\sigma/d\cos\theta_t$ for top-quark-pair-production in $p\bar{p}$ collisions at $\sqrt{s}$ = 1.96 TeV***

CDF Collaboration (T. Aaltonen *et al.*), Phys. Rev. Lett. 111, 182002 (2013)

***Measurement of the top quark forward-backward production asymmetry and its dependence on event kinematic properties***

CDF Collaboration (T. Aaltonen *et al.*), Phys. Rev. D 87, 092002 (2013).

***Search for the Standard Model Higgs boson produced in association with top quarks using the full CDF data set***

CDF Collaboration (T. Aaltonen *et al.*), Phys. Rev. Lett. 109, 181802 (2012).

## RECOGNITION AND AWARDS

Spring 2014    ***University Research Association Visiting Scholar Award*** *Texas A&M University*

Data acquisition and trigger electronics and software, SuperCDMS experiment

Spring 2012    ***University Research Association Visiting Scholar Award*** *University of Michigan*

Studies of top quark forward-backward asymmetry, CDF experiment

Spring 2009    ***Hazel Brown Teaching Assistant Award*** *The Ohio State University*

Spring 2009    ***AAPT Outstanding Teaching Assistant Award*** *The Ohio State University*

**William Carey Crane Scholar** *Baylor University*

## INVITED TALKS

Nov 2013    ***Anomalies in the Forward-Backward Asymmetry of Top Quark Pair Production at the Tevatron***

Texas A&M University High Energy Physics Seminar

Apr 2013    ***Anomalies in the Forward-Backward Asymmetry of Top Quark Pair Production at the Tevatron***

University of Virginia High Energy Physics Seminar

Mar 2013    ***Top Pair Production and Properties at the Tevatron***

Rencontres de Moriond, Electroweak Session

Feb 2013    ***Top Pair Forward-Backward Asymmetry at CDF***

Les Rencontres de Physique de la Vallée d'Aoste

Oct 2012    ***The Top Forward-Backward Asymmetry at the Tevatron***

The Seventh International Workshop on the CKM Unitarity Triangle

Apr 2012    ***The Top Forward-Backward Asymmetry at CDF***

Hot Topics at Colliders, Princeton University

Aug 2011    ***Search for the Standard Model Higgs Boson Produced in Association with Top Quarks at the Tevatron***

Supersymmetry 2011

## SKILLS

| | |
|---|---|
| Programming | C/C++  Python  Scheme/LISP  Fortran  Autoconf/Automake/Libtool  CVS/SVN/bzr/git |
| Scientific Analysis | CERN ROOT  Big data analysis  Bayesian inference and modeling |
| | Markov chain Monte Carlo  Digital signal processing |
| System Administration | Linux  Cluster administration  Designing and building computers and computer clusters |
| | Network administration |
| Authoring and Web Programming | LaTeX/RevTeX  HTML5/CSS3  Javascript |